

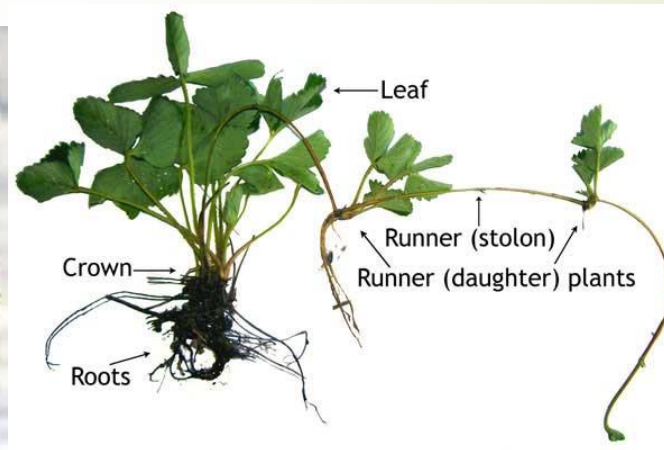
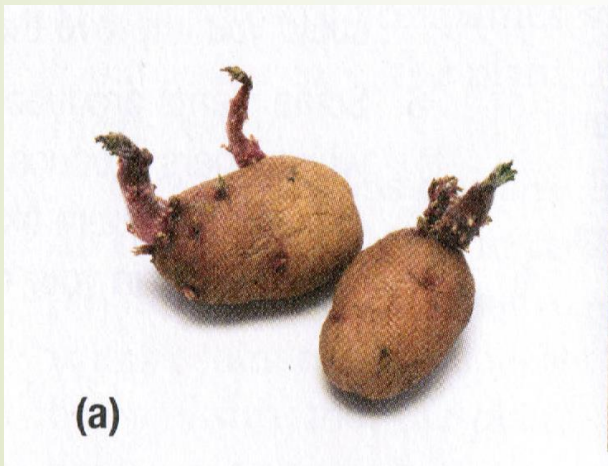


4.7 Reproduction in Plants

Reproduction can be asexual (vegetative) or sexual


1. Asexual Reproduction

- -no fusion of gametes
- -offspring are clones of the parents
- -New plants can arise from (a) stems, (b) leaves, and (c) roots.
 - eyes of tubers
 - kalanchoe plant produces new plant at leaf margin
 - runners/stolons can create new plants in strawberries





benefits include:

1. source of energy from parent plant,
 2. faster reproduction,
 3. inherits beneficial traits,
 4. already in a suitable habitat,
 5. only one parent needed.
- 



What are some of the drawbacks.....?

- Environment changes significantly all individual could die (no variation)
- Disease would wipeout the whole population

Some growers use specific techniques to induce asexual reproduction in ways that do not occur naturally.

- Grafting – involves cutting a young branch from a plant that has desirable characteristics and attaching it to the stem of another plant.

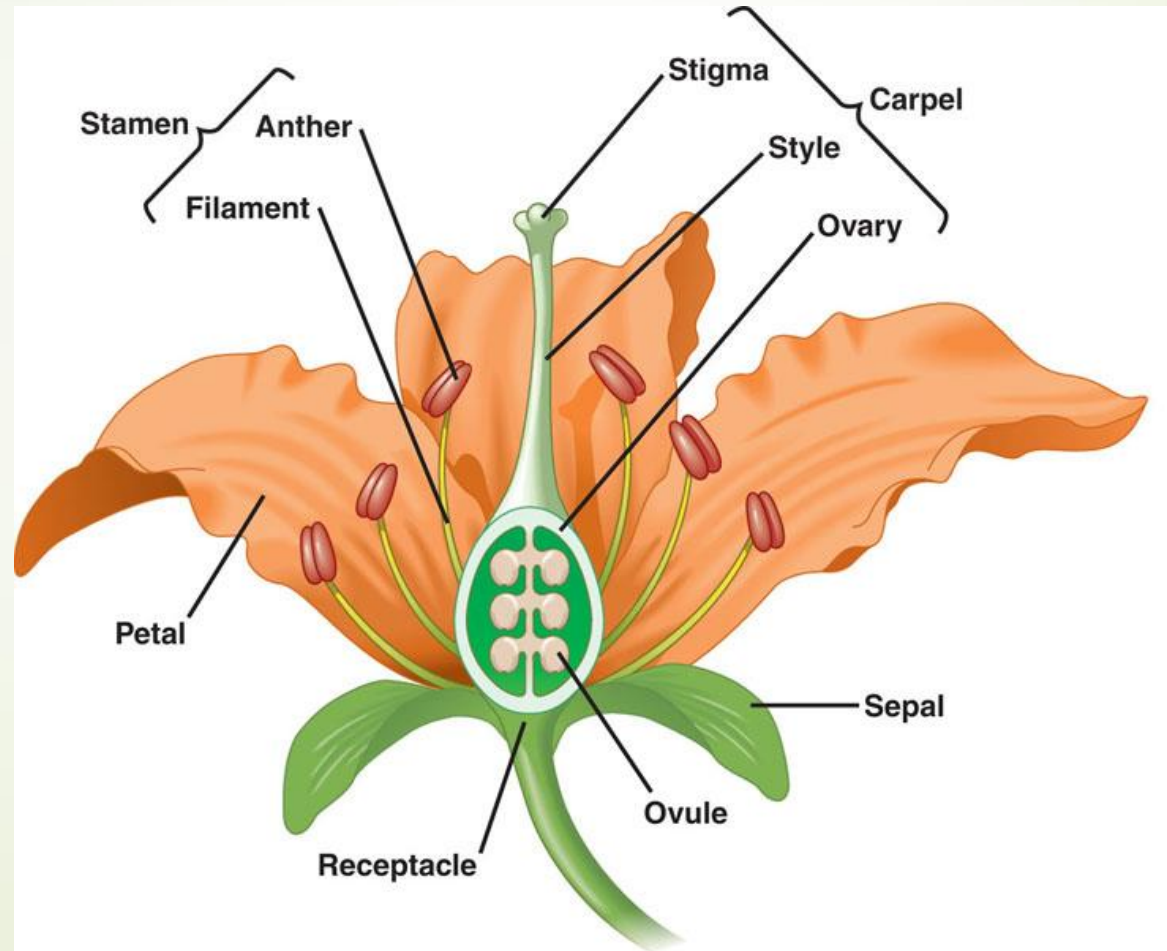
Example:

- Scions of grape plants that produce desirable fruit are often grafted onto stock of individuals with hardy, disease-and-insect-resistant roots



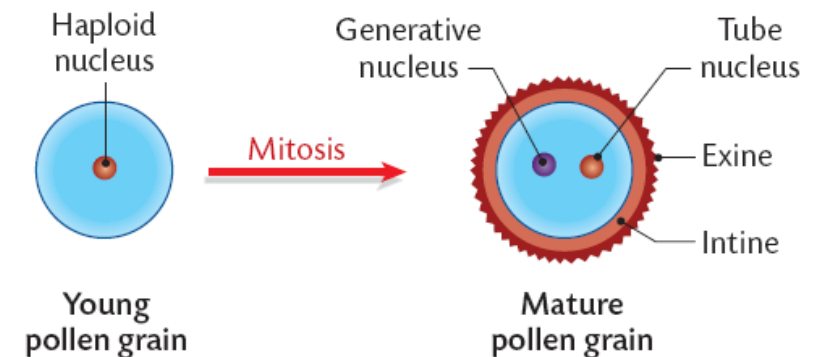
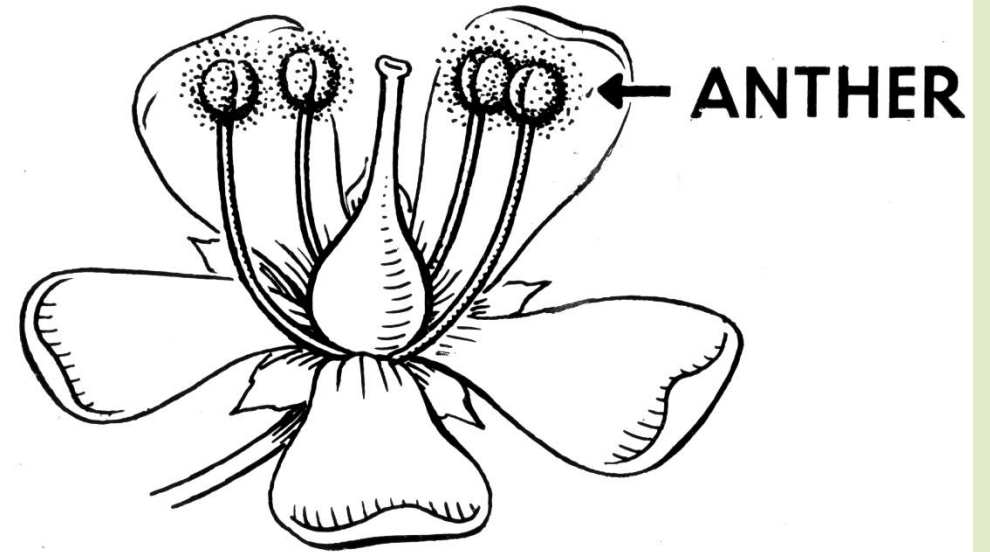
2. Sexual Reproduction (in angiosperms)

► Flower anatomy:



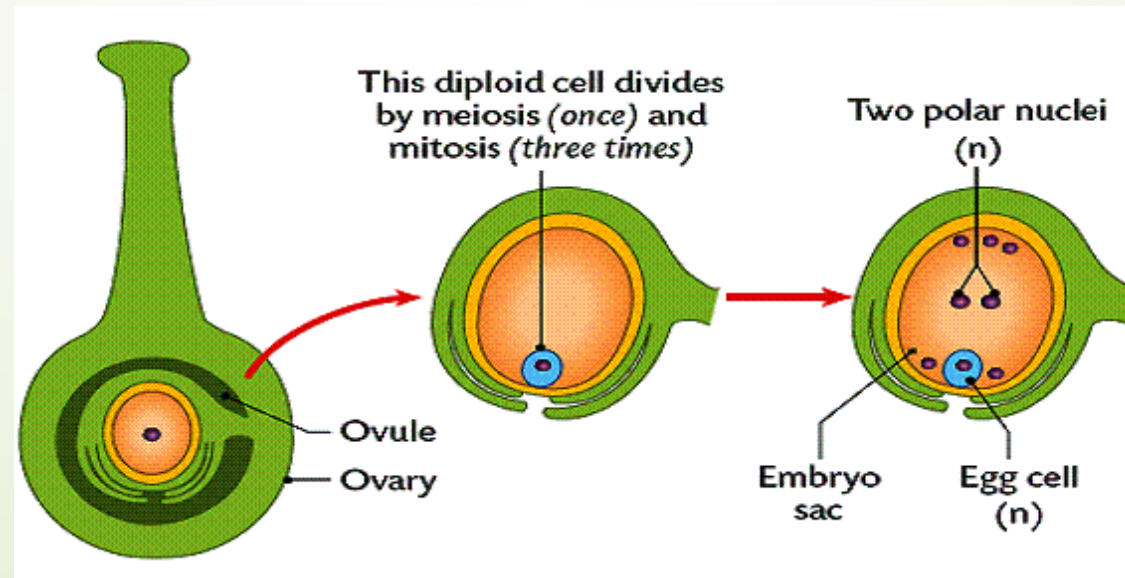
The Male (Microspore):

- Cells within the anther undergo meiosis to produce microspores. Microspores then develop into pollen. Pollen has a protective covering, contains two haploid nuclei, and through pollination sticks to the female flower structure.



The Female (Megaspore):

- Cells within the ovules produce the haploid megaspore within a huge cell with two other nuclei.
- The megaspore divides to produce an **egg cell** and other haploid nuclei including two polar nuclei.



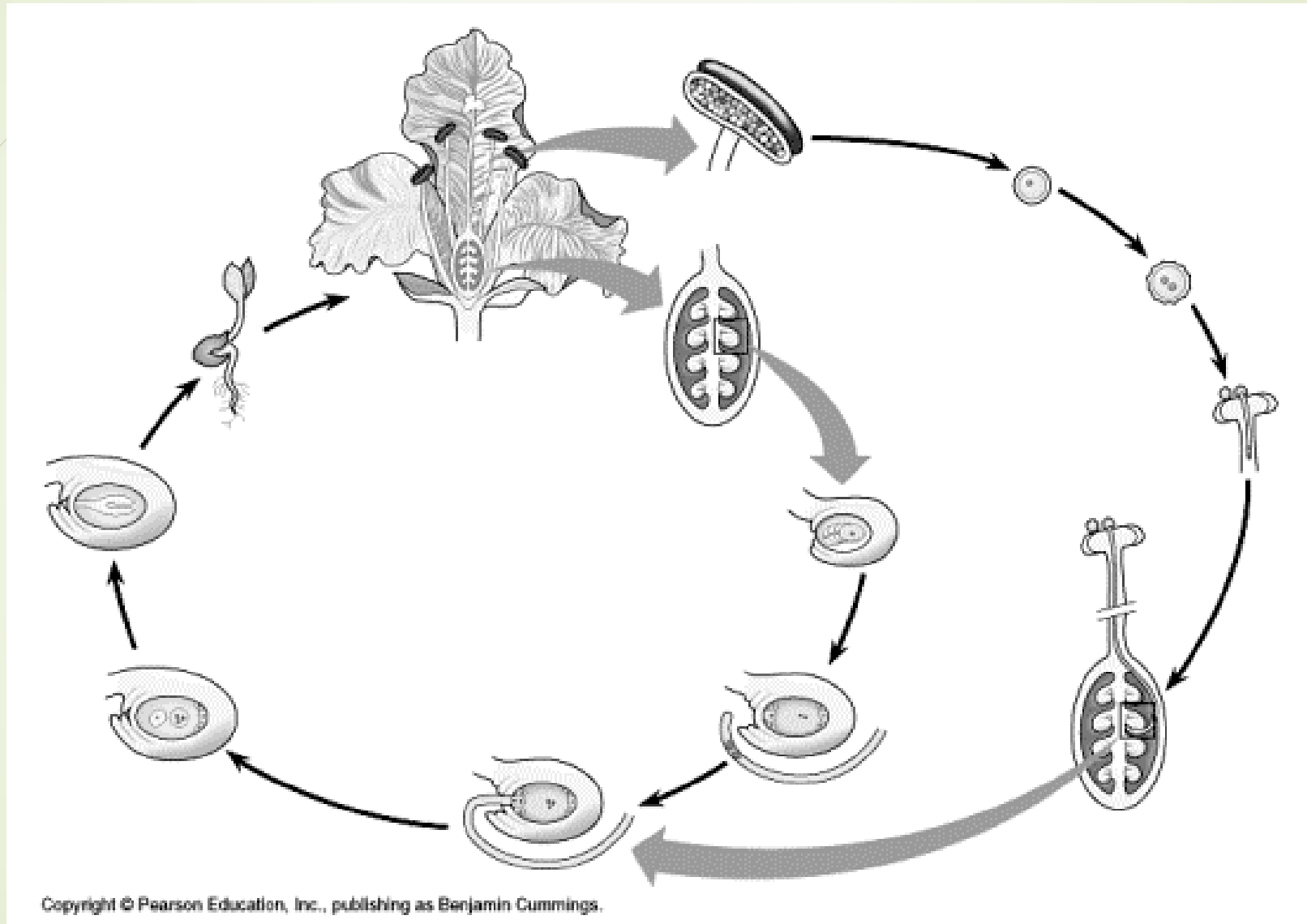


FERTILIZATION

Angiosperms have **DOUBLE FERTILIZATION**.

- pollen attaches to stigma
- pollen grains germinate (**pollen tube** grows down style)
- both haploid nuclei (sperm nuclei) pass down tube to an ovule
- one sperm fertilizes the megaspore = diploid embryo, one fertilizes the two polar nuclei = triploid nucleus (called **double fertilization**)
- This triploid nucleus turns into an endosperm, which nourishes the developing embryo.
- After fertilization, the ovule begins developing into a seed.

animation





A SEED develops!

Benefit of seeds

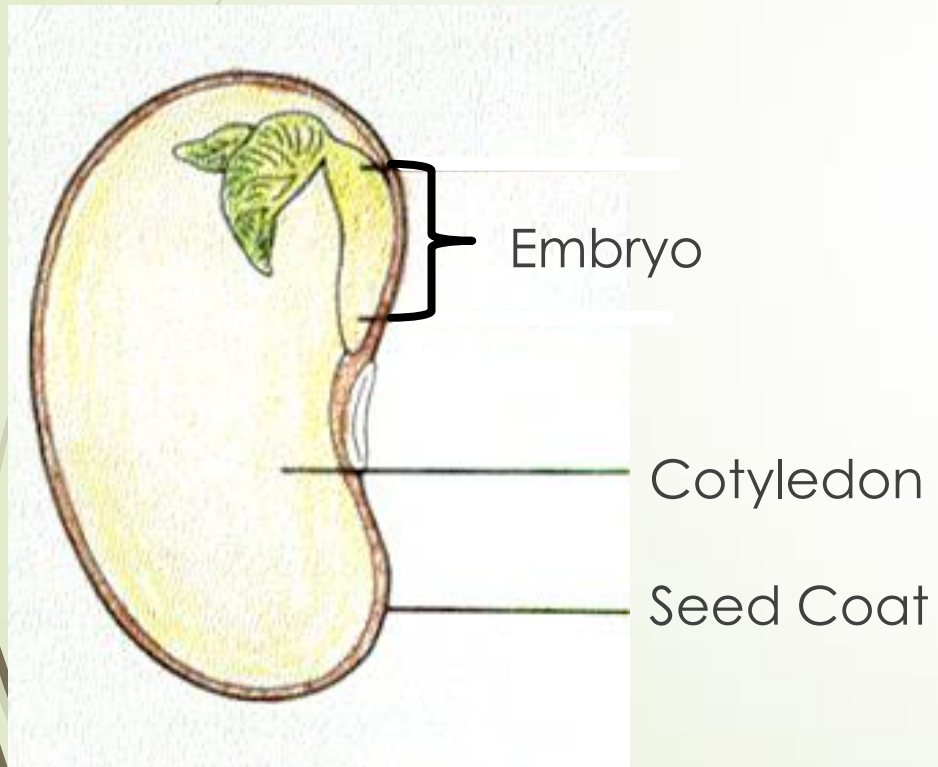
- protection and nourishment for the embryo
- dispersal

The Seed:

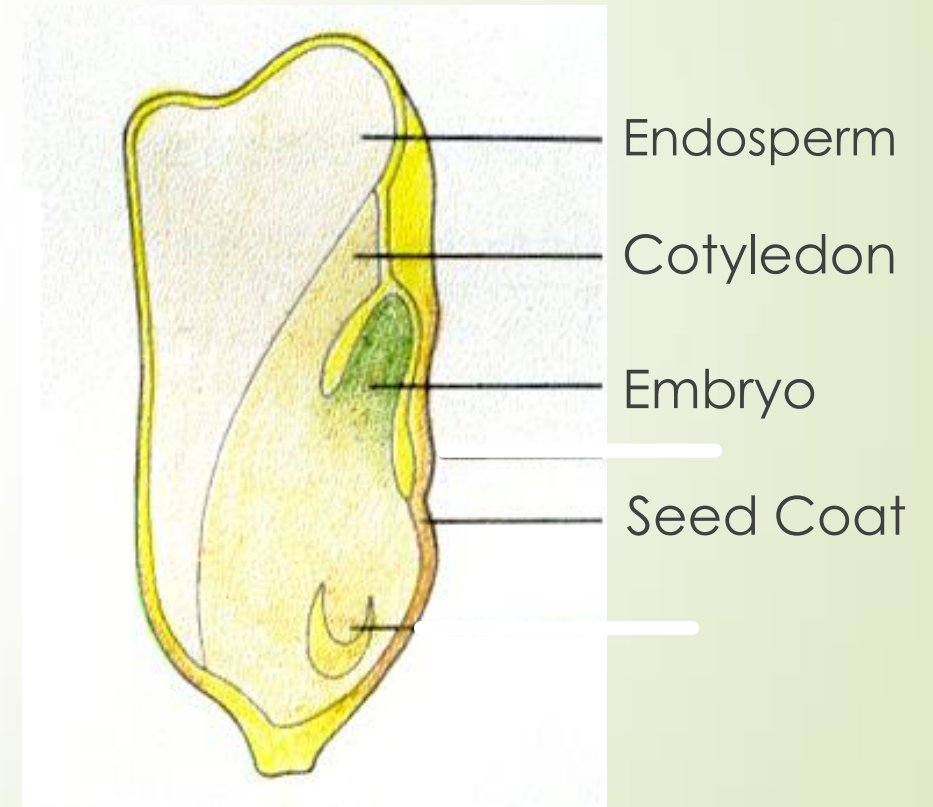
- Has 3 parts: seed coat, embryo, endosperm
- the endosperm fills with nutrients
- in eudicots the endosperm gets absorbed by two specialized seed leaves of the embryo called **cotyledons**
- in monocots the endosperm remains intact and provides nourishment for the embryo once the seed begins to germinate.

General Seed Structure

Eudicot

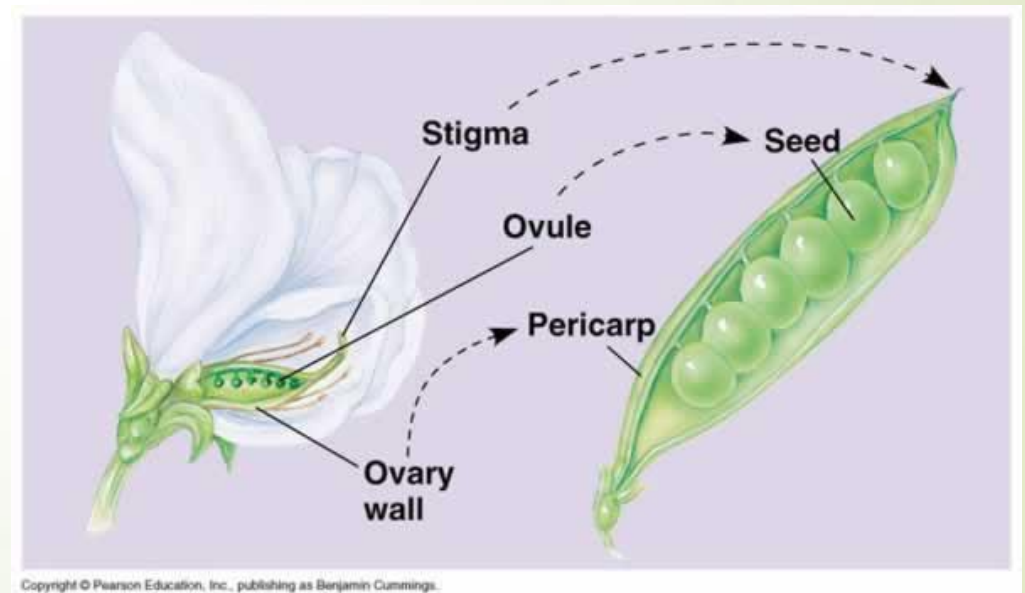
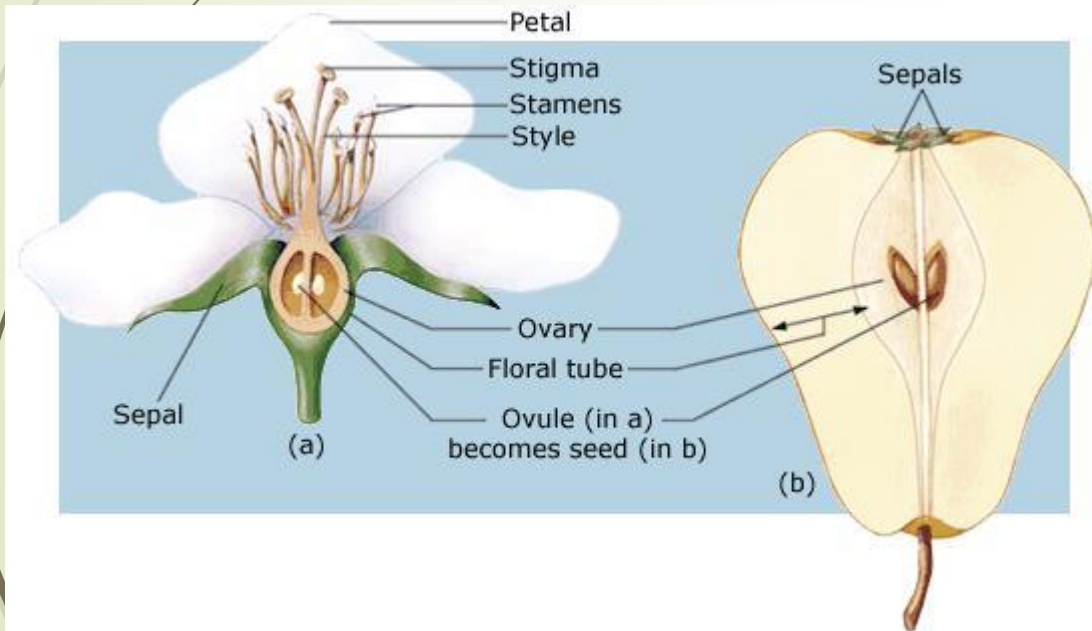


Monocot



The Fruit

- The ovule wall becomes the seed coat.
- The ovary and or the tissue around the ovary forms the **pericarp** (fruit body) which can be fleshy or hard depending on the dispersal strategy.



Life Cycle of a coniferous plant (gymnosperm)

FERTILIZATION

- Male cones are usually softy and short lived.
- Female cones are hard and they last long
- Large amounts of pollen released in the air
- Pollen grain lands on a female cone, the sperm fertilize the eggs.
- Seed remains on plant, within the female reproductive structure until they are mature.
- Can take several months to 3 years.
- Then released and carried away by wind or animal.

